

## APPENDIX H

### Rare Vascular Plants of the Black River/Meadow Valley Landscape

This appendix lists each of the rare plant species known to occur on the Black River State Forest/Meadow Valley Landscape (BRSF/MVL) and provides information on their conservation status. “Rare” plant species are treated here as native species known or suspected to be rare and/or declining in the state. Included are species legally designated as “Endangered” or “Threatened” by the State of Wisconsin, as well as species on the Department’s advisory “Special Concern”. Rare species information for the BRSF/MVL was compiled from existing records in the BER NHI Biological Conservation Database (BCD, now known as Biotics), field inventories, and other data sources.

The Wisconsin Natural Heritage Database lists 47 rare plant species in the study area. Heritage staff documented many of these rare species during recent field inventory, while others have not been seen for decades. In the last 30 years, biologists have confirmed 2 Wisconsin Endangered plant species and 5 Wisconsin Threatened plant species in the study area. These include Wisconsin Endangered reticulated nutrush (*Scleria reticularis*) and sand violet (*Viola fimbriatula*), and Wisconsin Threatened dwarf milkweed (*Asclepias ovalifolia*), bog bluegrass (*Poa paludigena*), pale green orchid (*Platanthera flava* var. *herbiola*), prairie parsley (*Polytaenia nuttallii*), and algae-like pondweed (*Potamogeton confervoides*). Before 1971, researchers documented four other Threatened or Endangered plant species, including woolly milkweed (*Asclepias lanuginosa*), large water-starwort (*Callitriche heterophylla*), brittle prickly-pear (*Opuntia fragilis*), and spotted pondweed (*Potamogeton pulcher*) that were not relocated during this inventory. Thirty-seven additional rare plant species found on the BRSF/MVL are designated of “special concern,” meaning experts suspect they are rare or declining, but have not yet gathered proof of threats to their survival in Wisconsin. There are no federally listed plant species documented in the study area.

| SCIENTIFIC NAME (COMMON NAME)                           | #  | State Rank | Global Rank | STATE STATUS | OBSERV DATE |
|---|----|------------|-------------|--------------|-------------|
| <i>Arethusa bulbosa</i> (Swamp-pink)                    | 4  | S3         | G4          | SC           | 1998        |
| <i>Artemisia frigida</i> (Prairie sagebrush)            | 1  | S2S3       | G5?         | SC           | 1936        |
| <i>Asclepias lanuginosa</i> (Woolly milkweed)           | 3  | S1S2       | G4?         | THR          | 1936        |
| <i>Asclepias ovalifolia</i> (Dwarf milkweed)            | 23 | S3         | G5?         | THR          | 2000        |
| <i>Aster longifolius</i> (Long-leaved aster)            | 1  | S1         | G5          | SC           | 1982        |
| <i>Bartonia paniculata</i> (Twining screwstem)          | 2  | S1         | G5          | SC           | 1998        |
| <i>Bartonia virginica</i> (Yellow screwstem)            | 70 | S3         | G5          | SC           | 1998        |
| <i>Callitriche heterophylla</i> (Large water-starwort)  | 2  | S2         | G5          | THR          | 1958        |
| <i>Carex assiniboinensis</i> (Assiniboine sedge)        | 3  | S3         | G4G5        | SC           | 1997        |
| <i>Carex cumulata</i> (Clustered sedge)                 | 14 | S2         | G4?         | SC           | 1997        |
| <i>Carex folliculata</i> (Long sedge)                   | 51 | S3         | G4G5        | SC           | 1999        |
| <i>Carex livida</i> var <i>radiculis</i> (Livid sedge)  | 2  | S2         | G5T5        | SC           | 1997        |
| <i>Carex straminea</i> (Straw sedge)                    | 3  | S1         | G5          | SC           | 1999        |
| <i>Ceratophyllum echinatum</i> (Prickly hornwort)       | 4  | S2         | G4?         | SC           | 1998        |
| <i>Cypripedium reginae</i> (Showy lady's-slipper)       | 1  | S3         | G4          | SC           | 1922        |
| <i>Didiplis diandra</i> (Water-purslane)                | 4  | S2         | G5          | SC           | 1997        |
| <i>Eleocharis engelmannii</i> (Engelmann's spike-rush)  | 1  | S2         | G4?         | SC           | 1972        |
| <i>Epilobium palustre</i> (Marsh willow-herb)           | 1  | S3         | G5          | SC           | 1958        |
| <i>Gnaphalium helleri</i> (Catfoot)                     | 1  | S1         | G4G5        | SC           | 1998        |
| <i>Juncus marginatus</i> (Grassleaf rush)               | 8  | S2         | G5          | SC           | 1997        |
| <i>Lycopodium porophyllum</i> (Rock clubmoss)           | 10 | S3         | G4          | SC           | 1997        |
| <i>Myriophyllum farwellii</i> (Farwell's water-milfoil) | 14 | S3         | G5          | SC           | 1997        |
| <i>Opuntia fragilis</i> (Brittle prickly-pear)          | 1  | S3         | G4G5        | THR          | 1947        |
| <i>Orobancha uniflora</i> (One-flowered broomrape)      | 1  | S3         | G5          | SC           | 1994        |

| SCIENTIFIC NAME (COMMON NAME)                                    | #  | State Rank | Global Rank | STATE STATUS | OBSERV DATE |
|--|----|------------|-------------|--------------|-------------|
| <i>Oryzopsis canadensis</i> (Canada mountain-ricegrass)          | 3  | S1         | G5          | SC           | 1997        |
| <i>Platanthera flava</i> var <i>herbiola</i> (Pale green orchid) | 1  | S2         | G4T4Q       | THR          | 1994        |
| <i>Platanthera hookeri</i> (Hooker orchis)                       | 1  | S3         | G5          | SC           | 1947        |
| <i>Poa paludigena</i> (Bog bluegrass)                            | 1  | S2S3       | G3          | THR          | 1997        |
| <i>Polygala cruciata</i> (Crossleaf milkwort)                    | 77 | S3         | G5          | SC           | 1998        |
| <i>Polytaenia nuttallii</i> (Prairie parsley)                    | 1  | S3         | G5          | THR          | 1987        |
| <i>Potamogeton confervoides</i> (Algae-like pondweed)            | 1  | S2         | G4          | THR          | 1975        |
| <i>Potamogeton diversifolius</i> (Water-thread pondweed)         | 10 | S2         | G5          | SC           | 1997        |
| <i>Potamogeton pulcher</i> (Spotted pondweed)                    | 1  | S1         | G5          | END          | 1938        |
| <i>Potamogeton vaseyi</i> (Vasey's pondweed)                     | 1  | S2         | G4          | SC           | 1969        |
| <i>Rhexia virginica</i> (Virginia meadow-beauty)                 | 15 | S2         | G5          | SC           | 1998        |
| <i>Salix sericea</i> (Silky willow)                              | 1  | S1         | G5          | SC           | 1933        |
| <i>Scirpus georgianus</i> (Georgia bulrush)                      | 1  | SH         | G5          | SC           | 1968        |
| <i>Scirpus torreyi</i> (Torrey's bulrush)                        | 2  | S2S3       | G5?         | SC           | 1998        |
| <i>Scleria reticularis</i> (Reticulated nutrush)                 | 1  | S1         | G4          | END          | 1997        |
| <i>Scleria triglomerata</i> (Whip nutrush)                       | 4  | S2S3       | G5          | SC           | 1997        |
| <i>Solidago sciaphila</i> (Shadowy goldenrod)                    | 17 | S3         | G3G4        | SC           | 1997        |
| <i>Strophostyles leiosperma</i> (Small-Flowered woolly bean)     | 3  | S2         | G5          | SC           | 1997        |
| <i>Talinum rugospermum</i> (Prairie fame-flower)                 | 5  | S3         | G3G4        | SC           | 1997        |
| <i>Thelypteris simulata</i> (Bog fern)                           | 60 | S3         | G4G5        | SC           | 1998        |
| <i>Utricularia geminiscapa</i> (Hidden-fruited bladderwort)      | 25 | S3         | G4G5        | SC           | 1998        |
| <i>Utricularia purpurea</i> (Purple bladderwort)                 | 1  | S3         | G5          | SC           | 1998        |
| <i>Viola fimbriatula</i> (Sand violet)                           | 17 | S2         | G5          | END          | 1997        |

## Field Survey Methods

A number of activities occur prior to the field season. First, all information on occurrences of state-listed rare vascular plants reported from the BRSF/MVL and surrounding area was obtained from the BCD and referenced to a set of USGS topographic quadrangles covering the area.

Second, staff visited the Wisconsin State Herbarium at the University of Wisconsin-Madison to become acquainted with unfamiliar or difficult to identify species. In some cases, herbarium specimens were photocopied and used as field references. At the herbarium, the draft "Flora of Wisconsin" was consulted to gain information on rare species likely to occur in the State Forest.

Third, staff visited DNR field offices. DNR personnel familiar with plant occurrences and ecological communities were consulted and queried about areas that would benefit from more intensive field surveys. This included sites identified as survey priorities by the NHI ecologist. In addition, forest compartment maps and air photographs maintained at these offices were analyzed.

Finally, staff consulted with local college personnel and amateur naturalists knowledgeable about rare plant populations and unusual plant communities.

During the course of the field season, specific plant communities of interest may be surveyed several times for potential rare species. Initial visits of terrestrial habitat were often made in May in order to detect the spring ephemeral flora, followed by later visits in June and July during the major part of the flowering season. Surveys of aquatic areas were usually conducted in July and August when floating and submerged species were most likely to be in flower/fruit. Later blooming species, including asters and goldenrods, were searched for in August and September.

In some areas, drive-by surveys on every town and forest road in the area have proven valuable, particularly for rare species occurring along roadsides. This involves searching for those natural community sites most likely to contain rare plants. Surveys by bicycle were useful in areas with hard-packed, clay forest lanes, as were others using all-terrain vehicles (ATVs) on sandy roads.

Various methods were used to search for rare plants. The method chosen depended upon the biologists' ability to maneuver through the habitat and the number of individuals conducting a given survey. Some surveys, especially those done in aquatic areas or by more than one individual searching for a fairly nondescript species, were done in a systematic fashion, often searching a habitat intensively along closely-spaced transect lines. Other surveys, where only one biologist was able to search an area and/or the potential habitat was reasonably consistent throughout, relied on the "meander" technique. In either case, the judgment and past field experience of the biologist involved is critical in areas of intensive field surveys that are often typified by subtle habitat differences.

When potential rare species are discovered, data are recorded on standard NHI field forms. If population size permits and if there is a question of identification, a voucher specimen is collected for later identification, verification, and deposition at the Wisconsin State Herbarium. In some cases, where a particularly rare species is found and/or population size is small, a diagnostic photograph may substitute for plant collection.

No survey can be completely comprehensive. For instance, it is impossible to search every square meter of habitat in difficult terrain when several hundred, or even thousand, hectares of similar habitat exist, (e.g. looking for particular sedge or other small species occurring in a vast sedge meadow). Logistical constraints prevent a thorough search of all potential habitat.

In addition, many rare plant species, such as orchids, may exist as short-lived, above ground plants that do not reliably appear every year. These, and other limitations not discussed here, must be taken into account when evaluating rare plant occurrences at any given site.

Typically, new and interesting sites are discovered throughout the course of the field season. Often these sites usually have had no survey coverage for seasons earlier than the initial visit. For example, a fine hardwood forest stand "discovered" in August may have spring ephemerals that have died back and are not evident at the time of the survey. Therefore, follow-up surveys of such sites are recommended for the spring or summer of the coming year. This point is worth stressing as the justification for thorough botanical surveys taking more than one field season since there are always significant plant sites that are missed during the first year of survey.

## **Rare Vascular Plant Descriptions**

The following is a description of each of the rare plants found on the Black River State Forest or the Meadow Valley Landscape Wildlife Areas, including status, conservation concern, and species management. The dates of last observations will vary greatly between species. An older, historic record does not necessarily mean the species no longer exists on the properties, only that it was not encountered during the inventory completed for this report. Each of the plants in this Appendix is accompanied by the Wisconsin protection status and a ranking code denoting its rarity in Wisconsin and throughout its range. These ranks are defined on the first pages of the Wisconsin Natural Heritage Working List (Appendix I).

Those species preceded by an asterisk (\*) are not found in the Black River State Forest (BRSF), but are known from other areas in the bed of old glacial Lake Wisconsin (GLW), known collectively as the Meadow Valley Landscape (MVL). The MVL includes the Meadow Valley State Wildlife Area (Jackson, Monroe, and Juneau Counties); Sandhill State Wildlife Area (Wood County); Jay Creek State Natural Area (Jackson County); county forest lands in Clark, Jackson, and Wood Counties; Wood County Wildlife Area; and Necedah National Wildlife Refuge (Juneau County).

Images, either photographs or line drawings, and additional information about the following species can be found by using the search engine at the Wisconsin State Herbarium website (<http://www.botany.wisc.edu/wisflora/>) or in the plant section of the NHI Working List on the Bureau of Endangered Resources website at [http://www.dnr.state.wi.us/org/land/er/working\\_list/taxalists/plants.htm](http://www.dnr.state.wi.us/org/land/er/working_list/taxalists/plants.htm).

♦ **Swamp-pink or dragon's-mouth (*Arethusa bulbosa*) – Special Concern, S3 G4**

A pink, single-flowered orchid of bogs and fens in the northeastern United States and adjacent Canada, this species is widely distributed in northern Wisconsin but uncommon in the central and south. There are no BRSF records, but there are 1980 and 1997 records from central poor fens in Jackson County Forest lands to the east.

There are a total of 100 Wisconsin sites; 16 of these were last seen before 1970. There are four swamp-pink populations within the study area, but none of them are on public lands in this survey. A Jackson County population was last observed in 1998.

**Conservation Concerns:** Outright habitat destruction, wetland drainage or other alterations of water levels, and invasive plant species.

♦ **Prairie sagewort (*Artemisia frigida*) – Special Concern, S2S3 G5?**

A prairie and barrens species of Canada and the central United States, this species is known from scattered localities in western and southern Wisconsin. It is often along railroad right-of-ways, raising questions about its nativity here, although there are undoubted native sites on bluff prairies along the Mississippi River. There are no BRSF records, but there is a 1936 collection from a railroad right-of-way in Wyeville, Monroe County.

There are a total of 19 Wisconsin sites; 12 of these were last seen before 1970. One population was reported within the study area in 1936. Researchers were unable to relocate prairie sagewort in 1997-8.

**Conservation Concerns:** Seeding is erratic with this species. It seems to require periodic disturbance to establish and persist although the type and frequency of disturbance are unknown.

♦ **Woolly milkweed (*Asclepias lanuginosa*) – Threatened, S1S2 G4?**

This inconspicuous, narrow-leaved flower of hillside prairies and savannas of the north central United States was known from 40 places around Wisconsin, but 25 of those have either been destroyed or not verified since 1970. A few populations have received careful attention in recent years, and not one of them has produced a pod. There are no BRSF records, but several collections were made from 1936-1940 nearby in the Necedah National Wildlife Refuge.

**Conservation Concerns:** This species is sensitive to forest succession, and may also be suffering a loss of effective pollinators.

♦ **Dwarf or oval-leaved milkweed (*Asclepias ovalifolia*) – Threatened, S3 G5?**

Another small milkweed, this species resembles a daintier version of common milkweed, with creamy white flowers. It is endemic to the central United States and adjacent Canada, and is known in Wisconsin from prairies and pine and oak barrens. Although it formerly grew throughout the prairie and savanna areas of southern Wisconsin, most of the extant populations lie in the central and northwestern parts of the state. To date, the historic records of dwarf milkweed are not entered in the Natural Heritage database. In 1995, researchers checked on 22 historic populations and found that 16 of them had been lost.

About 10 new populations were discovered in the BRSF in 1997, marking GLW as Wisconsin's best area for protecting dwarf milkweed. The colonies along Palm Road have about 1,000 plants and may be the largest in the state. The species thrives in powerline, railroad, and roadside right-of-ways where competition by woody vegetation is reduced, perhaps mimicking a natural fire regime. The largest population in "native" vegetation was located in Glenn Creek Barrens on Jackson County Forest land just west of BRSF. Five new populations were discovered in 1997-1998 in GLW outside the BRSF: four in Wood County (including Bison Prairie and Sandhill Savanna Restoration) and Juneau County (Rynearson Flowage Barrens).

**Conservation Concerns:** This milkweed relies on periodic disturbances of the type that keep pine and oak barrens free of shading and encroaching woody vegetation. In the absence of periodic fire, periodic brush removal in roadside, railroad, powerline, and pipeline rights-of-way appears to mimic the natural disturbance regime and aid this species. This clonal species depends on insect pollinators that may be adversely affected by herbicide spraying along rights-of-way.

◆ **Long-leaved aster (*Aster longifolius*) – Special Concern S1 G5**

This purple-flowered species has only been found 2 places in Wisconsin, both of them in moist, open sandy habitats within the bounds of Glacial Lake Wisconsin. The heart of long-leaved aster's range is east of Wisconsin, where it ranges from Florida to Quebec and Ontario. In Michigan it grows in a variety of damp open sandy, gravelly or rocky habitats. Although both of Wisconsin's documented populations fall within the study area, neither of them is on public land. The Natural Heritage Inventory recently added long-leaved aster as a species of special concern. Researchers did not explicitly search for this species. It is quite possible that it is growing unnoticed on state land.

**Conservation Concerns:** The moist open habitats this species requires are attractive to recreational ATV users, who may mechanically destroy the plants. This habitat depends on water level fluctuations or periodic disturbance such as fire to prevent thick woody growth.

◆ **Panicled screwstem (*Bartonia paniculata*) – Special Concern S1 G5**

This tiny, hemi-parasitic gentian family member occurs along the East Coast of the United States and adjacent Canada, with scattered stations inland. The species was first discovered in Wisconsin in 1998 east of the BRSF in seasonally wet, sandy-peaty ditches on Jackson County Forest lands north of Hwy. 54. It was also found in Meadow Valley Wildlife Area along Norway Ridge Road in Monroe County. Due to its close resemblance to the next species, it may have been overlooked in GLW. It associates with crossleaf milkwort, Virginia meadow-beauty, and sphagnum and haircap mosses.

**Conservation Concerns:** Populations of this species apparently depend on periodic bare mineral soil. In pre-settlement times, this regime may have included catastrophic fires, or perhaps the trails and/or wallows of large animals such as deer, elk, or bison. Currently, periodic maintenance of roadside, railroad, powerline, and pipeline rights-of-way, appears to mimic the natural disturbance regime and maintains this species, and will continue to in many areas (such as along major highways). In other habitats (such as mown trails), there is no assurance that this disturbance regime will continue for the long term. "Natural" populations have very small numbers (often less than 10 individuals) and exist in only a few peatlands and swamp forests. All populations appear to vary greatly from year to year in numbers of individuals, with only a small percentage of seemingly suitable habitat occupied in a given year.

◆ **Yellow screwstem (*Bartonia virginica*) – Special Concern, S3 G5**

This species of the eastern United States and Canada is much more common in Wisconsin than the preceding one. Yellow screwstem prefers seasonally wet, periodically disturbed sandy-peaty ditches where it occurs in small colonies in sphagnum or haircap moss beds. It is often associated with crossleaf milkwort and

Virginia meadow-beauty. Less common habitats include acidic sphagnum woods, poor fens, and even moist riverbanks.

There are a total of 93 Wisconsin occurrences; 17 of these were last seen before 1970. The great majority of state sites occur in the Black River/Meadow Valley landscape. In 1997-8, researchers found 57 new occurrences, including 19 in BRSF, 11 in Jackson County outside the forest, 18 in Juneau County, 5 in Wood County, 2 in Monroe County, and one each in Clark and Eau Claire Counties.

**Conservation Concerns:** See discussion under panicled screwstem.

◆ **Large water-starwort (*Callitriche heterophylla*) – Threatened, S2 G5**

This floating aquatic grows in most of the United States in quiet or slowly flowing waters. It occurs as scattered, mostly historic sites in southwest Wisconsin. There are three historic (1938-1958) sites in BRSF that were not relocated in 1997-1998: Perry Creek, Morrison Creek, and Little Bear Flowage. The species appears to have declined and perhaps disappeared from BRSF/MVL, for unknown reasons. There are recent records from Fort McCoy Military Reservation in adjacent Monroe County.

There are a total of 13 Wisconsin sites; 8 of these were last seen before 1970. Two historical sites fall within the Black River/Meadow Valley landscape.

**Conservation Concerns:** Unknown water quality requirements. Large water-starwort is probably also affected by factors that generally threaten aquatic species: the sometimes dramatic water fluctuations associated with dams, erosion and consequent siltation, stream channelization, and changes in water levels, especially lowered.

◆ **Assiniboine sedge (*Carex assiniboinensis*) – Special Concern, S3 G4G5**

A sparsely-flowered, clone-forming sedge with long, looping, “walking” stoloniferous stems, this species of the north-central United States and adjacent Canada is known from central and northern Wisconsin. In BRSF, it was discovered in three places in shaded, infrequently flooded, rich, mesic floodplain terrace deciduous forests along the Black River in 1997. In the Black River corridor, it grows in a forest type whose understory has been greatly affected by logging and past grazing (causing a proliferation of thorny shrubs).

There are a total of 31 Wisconsin sites. Three of these were last seen before 1970. Three sites on Black River State Forest were documented in 1997.

**Conservation Concerns:** damming could destroy habitat; watershed development could result in flashier flood cycle that might scour floodplain habitat. Intensive logging resulting in sites that are too sunny and dry could alter the necessary habitat.

◆ **Clustered sedge (*Carex cumulata*) – Special Concern, S2 G4?**

A sedge of the northeastern United States and adjacent Canada, this is a member of the difficult Oboles section of the genus *Carex*. In the BRSF, about 6 new sites were discovered in 1997, mostly in disturbed moist to dry sandy areas such as moss-drying clearings and roadside ditches: Circle Marsh, Battle Point Ridge, and Hatfield Dells. It also occurs in similar habitats in the Meadow Valley landscape. In 1997-1998 it was also discovered in Wood County (Cranberry Road), Juneau County (Kingston Flowage), and Monroe County (Atwood Avenue).

There are a total of 18 Wisconsin sites; 7 of these were last seen before 1970. Fourteen sites occur in the study area, with 9 of them on Black River State Forest and 2 on Meadow Valley Wildlife Area.

**Conservation Concerns:** This species appears to prefer very disturbed areas. It is often a pioneer and one of the first species to appear on graded, dry sandy roadsides or on recently used mowing platforms. It is vulnerable to overly frequent disturbance that might result in the loss or deletion of the seed bank, or a cessation or inappropriate timing of disturbance.

◆ **Long sedge (*Carex folliculata*) – Special Concern, S3 G4G5**

This is distinctive large wetland sedge with star-like clusters of fruits on long whip-like stems, this species is found in the eastern United States and adjacent Canada. In Wisconsin, other than one recent record in Iron County, long sedge is restricted to Glacial Lake Wisconsin, where it typically grows in White Pine – Red Maple Swamps, but also in poor fens, alder thickets, and tamarack swamps, often becoming locally dominant. Common understory associates are cinnamon fern, skunk cabbage, winterberry holly, and bog fern.

There are a total of 71 Wisconsin sites; 4 of these were last seen before 1970. In the study area, there are 51 known long sedge populations. These include six on Meadow Valley Wildlife Area and 31 on BRSF.

**Conservation Concerns:** This sedge grows in white pine – red maple swamps and adjacent alder thickets. Unlike its frequent associate *Thelypteris simulata*, it appears to tolerate large canopy gaps in swamp forests, and populations can greatly expand in size after logging. Management of this species should be balanced with that of *Thelypteris simulata*. It is recommended that logging operations not take place. Canopy gaps should be permitted to form and close naturally. However, if logging is deemed to be necessary in this habitat, it should be done in a manner that mimics natural canopy gap formation.

◆ **Livid sedge (*Carex livida* var. *radicaulis*) – Special Concern, S2 G5T5**

This pale, ghostly (but definitely not “livid”) sedge prefers cold alkaline wetlands and occurs circumboreally south to the northern tier of the United States. Wisconsin localities are mostly in the northern part of the state, near the Great Lakes. There are no BRSF localities, but one was discovered in 1997 in a seasonally wet sandy, peaty ditch along Old Highway 54 east of the Forest, with Virginia meadow-beauty and crossleaf milkwort. There is also a 1961 collection from a cranberry bog in southwestern Wood County.

There are a total of 17 Wisconsin sites. One of these was last seen before 1970. We have reports of 2 populations within the study area, but neither falls on public land in this survey.

◆ **Greenish-white sedge (*Carex longii*) – Special Concern, S1 G5**

We currently have no solid proof that greenish-white sedge has ever lived in our study area. Years ago, an esteemed researcher identified his collection from Lee Lake (near Millston) as *Carex longii*. Under recent scrutiny, the specimen turned out to be *C. merritt-fernaldii*, a species that is not listed in WI. There is only one confirmed record of *Carex longii* in Wisconsin, and that is in LaCrosse County.

◆ **Straw sedge (*Carex straminea*) – Special Concern, S1 G5**

This is a member of the difficult *Ovales* section of the genus *Carex*. Found in the northeastern United States and adjacent Canada, it is known only from only a few sites in a 5-county area around BRSF. A 1947 collection site from the Clear Creek Fen area along the Black River in BRSF was not relocated in 1997. There is also a 1958 collection from the sandy shores of Lee Lake, an artificial impoundment near Millston. Despite several searches, biologists did not relocate straw sedge there in 1997. In the intervening 39 years the jack pine forest around the lake has greatly matured. This change may have eliminated potential habitat for this species. A new population was discovered in 1999 in a sandy-peaty ditch adjacent to a central poor fen along Highway 173 near Valley Junction in Monroe County.

There are a total of 5 Wisconsin sites; 3 of these were last seen before 1970. Of the two recently documented sites, one is within the study area, and the other is nearby in Juneau Co.

**Conservation Concerns:** Succession. See *Bartonia paniculata*.

◆ **Prickly hornwort (*Ceratophyllum echinatum*) – Special Concern, S2 G4?**

This submersed aquatic of shallow soft water ponds and lakes is found throughout the Americas. In Wisconsin, it is infrequent, preferring soft substrates and growing in water as deep as 3m. It is known from artificial impoundments in Juneau County (Meadow Valley Flowage), Monroe County (Monroe County Flowage), and Wood County (North Gallagher Flowage), where it was found in 1997-1998.

There are a total of 21 Wisconsin sites; 8 of these were last seen before 1970. One population was documented on Sandhill Wildlife area in 1998, and 3 other populations fall within the study area.

**Conservation Concerns:** Particular about alkalinity, pH, and possibly turbidity.

◆ **Showy lady's-slipper (*Cypripedium reginae*) – Special Concern, S3 G4**

There is a 1922 record of this large colorful orchid from Black River Falls. It has not been found since in either Jackson County or GLW. Judging from its habitat preferences elsewhere in Wisconsin, mostly likely it grew in a rich seepage area in a hardwood forest near the Black River, possibly on a back terrace in the floodplain. Suitable habitat is very limited within the study area. Deer herbivory is suspected to have contributed to the decline of this orchid of the eastern United States and Canada.

There are a total of 105 Wisconsin sites; 50 of these were last seen before 1970. The single BRSF population may still exist, as showy lady's slipper may yet grow in deciduous forests west of Black River Falls that were not searched during the 1997-8 survey.

**Conservation Concerns:** Dense concentrations of deer. Flooding of suitable habitat. Overcollecting and poaching.

◆ **Water-purslane (*Didiplis diandra*) – Special Concern, S2 G5**

An inconspicuous creeping plant of wet shores and shallow water of the central and eastern United States, water-purslane is rare through a large portion of its range, including central and southern Wisconsin. In 1997 it was collected from the shores of an artificial impoundment (Ball Road Flowage) in Wood County. There are historic records from Juneau County (1973) and Monroe County (1959).

There are a total of 6 Wisconsin sites. Four of these fall within the study area. The 2 that fall outside this study area have not been verified since 1958 and 1970, respectively.

**Conservation Concerns:** Suppression of periodic disturbance, such as water fluctuations that mimic a natural flooding regime.

◆ **Engelmann spike-rush (*Eleocharis engelmannii*) – Special Concern S2 G4?**

While it has a widespread range across North America, *E. engelmannii* is very uncommon in the western Great Lakes states. In WI, it seems to grow in shallow water along fluctuating shorelines. Researchers have reported Engelmann spike rush from only 3 places in Wisconsin since 1970, and one of those was Mill Bluff State Park in Monroe County. Eight more Wisconsin sites were last verified before 1970.



**Conservation Concerns:** The moist open habitats this species uses are attractive to recreational ATV users, who may mechanically destroy the plants. This habitat depends on water level to prevent thick woody growth. Lowering the water table through wells could reduce habitat for this species.

◆ **Marsh willow-herb (*Epilobium palustre*) – Special Concern, S3 G5**

A small herb of open wetlands, this species of the central and eastern United States is scattered throughout Wisconsin, mostly in the far north. There is a 1959 collection from the Ketchum-Starlight Peatlands in the BRSF. It was not relocated in 1997-1998, but this is an inconspicuous species and it could have been overlooked here and at other sites.

There are a total of 33 Wisconsin sites; 5 of these were last seen before 1970, including the one from the BRSF.

**Conservation Concerns:** Wetland destruction, including drainage. Other alterations in water level.

◆ **Catfoot (*Gnaphalium helleri*) – Special Concern S1 G4G5**

Known from most of the eastern United States, this species grows in dry sandy oak, aspen and jack pine woodlands. We only know of 4 populations of this flower in Wisconsin. All of them are from GLW, and 3 of them were last verified before 1960. The only recently verified population is from Bear Bluff, in Jackson County.

**Conservation Concerns:** The woodland habitat is vulnerable to succession or conversion to plantation.

◆ **Butternut (*Juglans cinerea*) – Not Actively Tracked, S3? G4**

This eastern North American tree is being extirpated by a blight that has now affected nearly all populations in Wisconsin. It is frequent in the BRSF along the Black River in rich mesic terrace or floodplain forests, mostly as dead trees; only a few living individuals were seen, and these were succumbing to blight.

**Conservation Concerns:** disease.

◆ **Grassleaf rush (*Juncus marginatus*) – Special Concern, SU G5**

A frail-looking rush that grows in much of the United States and adjacent Canada, this species is scattered and possibly overlooked in wet, young (10-40 years old, probably the result of small clear cuts) jack pine stands with partly open sandy-peaty ground in the understory. It often grows with other rare species such as crossleaf milkwort and yellow screwstem.

Researchers have documented grassleaf rush in 17 places across Wisconsin, of which 8 haven't been verified since 1970. It was discovered at six sites in the BRSF and 1 on Wood County Forest Crop Land in 1997. Most of Wisconsin's recently verified sites fall within the study area.

**Conservation Concerns:** Requires periodic disturbance.

◆ **Rock or cliff clubmoss (*Lycopodium porophyllum*) – Special Concern, S3 G4**

Also known as *Huperzia porophylla*, this regional endemic is nearly restricted to the “driftless area” of southeastern Minnesota, southwestern Wisconsin, northeastern Iowa, and northwestern Illinois. It is known from several new and relocated historic sites in the BRSF, mostly near the Black River and along the lowermost gorges of its tributaries Perry Creek, Halls Creek, and Morrison Creek. A new site was also found on a sandstone road cut on Highway 54 near Saddle Mound on Jackson County Forest land, and

another at Castle Mound in the BRSF. A new county record was also found at Wildcat Mound in Clark County. The preferred habitat is mossy, usually north-facing shelving sandstone cliffs under red maple, yellow birch, white birch, or less commonly jack pine. The more common, more robust shining clubmoss (*L. lucidulum*) is often present at these sites, too. At such places a few intermediate, presumably hybrid individuals may also found.

There are a total of 25 Wisconsin sites; 2 of these were last seen before 1970. It occurs at 6 sites in the BRSF and 4 more within the study area.

**Conservation Concerns:** This cliff pteridophyte occupies a narrow niche and probably never grew in large numbers. Quarrying or other habitat destruction.

◆ **Farwell's water-milfoil (*Myriophyllum farwellii*) – Special Concern, S3 G5**

This submersed aquatic grows primarily in low alkalinity, low pH and low conductivity water in the eastern United States and adjacent Canada. It is scattered throughout Wisconsin but may simply be overlooked. 1997-1998 surveys revealed it to be locally abundant in many of the artificial impoundments of the BRSF (Dry Land, Funmaker, Wildcat, Teal, Railroad, and Oxbow Pond Flowages) as well as lands in GLW to the east, often in flowages and drainage ditches. In Juneau County it is known from Meadow Valley Flowage, and in Wood County from Remington Ditch and Ball Road Flowage.

There are a total of 36 Wisconsin sites. Nine of these were last seen before 1970. Fourteen sites occur in the study area, making BRSF/MVL an important concentration area for this species.

**Conservation Concerns:** This water-milfoil grows in locally large populations within the Black River and Meadow Valley landscapes, all in artificial flowages. Natural ponds and lakes were rare or non-existent in the pre-settlement landscape here. Migrating waterfowl may have introduced *Myriophyllum* to this region after the flowages were built. As long as these flowages are maintained, this species should prosper here. If the maintenance stops, the culverts will eventually plug, dikes will be breached, and the species will be lost from the landscape.

◆ **Brittle prickly pear (*Opuntia fragilis*) – Threatened, S3 G4G5**

This little cactus with big flowers is found most often in the Great Plains and Rocky Mountains, but it grows in scattered Wisconsin places as far east as Waupaca County. It tends to grow on sunny, rocky or sandy, non-tillable land. In the past, avid cactus collectors may have significantly depleted populations of brittle prickly pear in Wisconsin. It may be prudent to minimize publicity regarding populations to avoid attracting poachers. Researchers have reported brittle prickly pear from 42 Wisconsin sites, but in the BR/MVL, we have heard no report of brittle prickly pear since 1947, and then it was on private land. Trees seem to have invaded that site in subsequent years.

**Conservation Concerns:** succession to forest; disruption of potential habitat by recreationists; poaching.

◆ **One-flowered broomrape (*Orobanche uniflora*) – Special Concern, S3 G5**

Like other members of the broomrape genus, this little flower gets its nourishment by tapping the roots of other plants rather than by photosynthesizing. It grows in a wide variety of habitats, from dry prairies to moist woods, and never seems to be abundant in any one place. Researchers have reported one-flowered broomrape from all over North America, but it is considered rare in many states and provinces. We know of 51 Wisconsin populations, of which 23 haven't been confirmed since 1970. The one known population in BRSF/MVL is on Necedah Wildlife Reserve in an oak-pine barren.

**Conservation Concerns:** Uncertain because the wide variety of habitats for this species makes it hard to judge what people could do to encourage or harm it.

♦ **Canada mountain-ricegrass (*Oryzopsis canadensis*) – Special Concern, S1 G5**

As the name implies, this species of northeastern North America is rare south of the Canadian border. Found in pine barrens and woodlands, it is one of Wisconsin's rarest grasses. There are several historic sites and two extant sites in Vilas County. In the BRSF, a 1958 site from Little Bear Flowage was not relocated in 1997; neither was a 1915 site from Trow Mounds in nearby Clark County. A new population was discovered in 1997 growing in an oak woodland in the Rudd Hills in the extreme SE corner of the Forest. In Wisconsin, this species has probably suffered from the suppression of large intense fires.

**Conservation Concerns:** fire suppression.

♦ **American ginseng (*Panax quinquefolius*) – Not being actively tracked, S4 G4**

This commercially valuable herb of the eastern United States and adjacent Canada has become infrequent in Wisconsin. A few plants were discovered in 1997 in a rich mesic deciduous forest on a terrace of the Black River, within the BRSF.

**Conservation concerns:** poaching; overharvesting.

♦ **Pale green orchid (*Platanthera flava* var. *herbiola*) – Threatened, S2 G4T4Q**

Found in the eastern United States and adjacent Canada, this orchid is scattered throughout Wisconsin in wet prairies, shrub carrs, and roadside ditches. It is not known from the BRSF, but was collected in 1994 from a floodplain forest along the Yellow River south of Babcock in Wood County.

There are a total of 36 Wisconsin sites; 15 of these were last seen before 1970. One population was documented in the study area (apparently on private land along the Yellow River) in 1994.

**Conservation Concerns:** uncertain

♦ **Hooker's orchid (*Platanthera hookeri*) – Special Concern, S1 G5**

A woodland orchid of the eastern and central U.S. and adjacent Canada, Hooker's orchid is scattered throughout WI in a variety of habitats ranging from old growth forests to pine plantations. There is a 1948 collection from the Morrison Creek Gorge area of the BRSF. This site was not relocated in 1997, but the species could still occur somewhere in the area.

There are a total of 58 Wisconsin sites; 38 of these were last seen before 1970, including the above BRSF site.

**Conservation Concerns:** Logging, development.

♦ **Bog bluegrass (*Poa paludigena*) – Threatened, S2S3 G3**

This nondescript little grass is endemic to springy areas and forested seeps in the northeastern United States. It is scattered in Wisconsin, where it is most common along the St. Croix River and in the south and east. The only BRSF site was discovered in 1997 in the Clear Creek Fen near the Black River. It may also occur in a skunk cabbage seep, on the east bank of the Black River just north of the confluence of Morrison Creek. This species may be more overlooked than rare; in addition to its small size, its flowering period is short, only a week or two at a given site.

Besides the single BRSF site noted above, there are a total of 31 Wisconsin sites. Three of these were last seen before 1970 and 3 have been extirpated.

**Conservation concerns:** This species' preferred habitat usually comes in small patches, making it especially vulnerable to mechanical disturbance. It depends on groundwater flow, which could be interrupted by lowering the water table.

◆ **Crossleaf milkwort (*Polygala cruciata*) – Special Concern, S3 G5**

A species of the Atlantic coastal plain of the eastern United States, crossleaf milkwort (also known by the equally descriptive name of “drum heads”) is more scattered inland. In Wisconsin it occurs in the central and southern parts of the state, especially in GLW. The species prefers acid, seasonally wet, sandy-peaty ditches, young jack pine stands revegetating cleared areas, and ATV trails. Crossleaf milkwort becomes incredibly abundant where periodic mowing eliminates competing plants. About the only native habitat noted (and this was not common) was along deer trails through poor fens and open tamarack swamps. In GLW outside the BRSF, new sites were found in Juneau County (14), Monroe County (8), Wood County (3), and Clark County (1).

There are a total of 94 Wisconsin sites. Eighteen of these were last seen before 1970, and one is extirpated. Sixty-seven of these sites are in the Black River/Meadow Valley landscape and have been newly found since 1994. In the BRSF proper, about 10 historical sites were relocated and 30 new sites found in 1997-1998.

**Conservation concerns:** Like *Bartonia paniculata*, this species is apparently dependent on periodic disturbances that expose mineral soil for population maintenance. In pre-settlement times, this regime may have included catastrophic fires, or perhaps the trails and/or wallows of large animals such as deer, elk, or bison. Currently, periodic maintenance of roadside, railroad, powerline, and pipeline rights-of-way, and mowing of peatlands, provides suitable habitat, and will continue to in many areas (such as along major highways). In other habitats (such as mown trails), there is no assurance that this disturbance regime will continue for the long term. “Natural” populations have small numbers and exist only in scattered peatlands.

◆ **Prairie parsley (*Polytaenia nuttallii*) – Threatened, S3 G5**

Prairie parsley ranges from Minnesota and Wisconsin to Nebraska, south to Mississippi, Texas, and New Mexico. It is restricted to roughly the southwest quarter of Wisconsin. Prairie parsley grows in dry to wet-mesic prairies and also in savannas. There are 47 records in Wisconsin, including 24 since 1971 including a record from the study area.

**Conservation concerns:** Loss of habitat due to land conversion and degradation. Fire suppression.

◆ **Algae-like pondweed (*Potamogeton confervoides*) – Threatened, S2 G4**

Known from Labrador to South Carolina, algae-like pondweed is at the western edge of its range in Wisconsin. It grows submersed in quiet, shallow, acid ponds and lakes of low conductivity and low alkalinity. Known from 12 sites (4 historical) in Wisconsin, nearly all in the north. Although it was collected in 1975 from Meadow Valley Flowage in Juneau County, researchers could not find it there in 1997-1998.

**Conservation concerns:** Water quality.

◆ **Water-thread pondweed (*Potamogeton diversifolius*) – Special Concern, S2 G5**

This submersed aquatic, also known as *P. capillaceus*, is found in the northeastern United States and adjacent Canada. In Wisconsin it is found throughout the state in a dozen sites in two concentrations -- Vilas-Oneida Counties and GLW. In BRSF, it was found to be locally common in two artificial impoundments: Funmaker and Battle Point Flowages. In GLW outside BRSF, it was discovered in similar habitats in Juneau County (Cutler Pond, Meadow Valley Flowage) and Wood County (Remington Ditch, Cranberry Road, Corner Marsh, and Ball Road Flowage).

There are a total of 13 Wisconsin sites, and all of them have been verified in recent decades. Ten are from the Black River/Meadow Valley landscape.

**Conservation concerns:** This pondweed grows in locally very large but localized populations within the Black River and Meadow Valley landscapes, all in artificial flowages. Natural ponds and lakes were rare or non-existent in the pre-settlement landscape here. Migratory waterfowl may have introduced *Potamogeton capillaceus* after people built flowages. As long as these flowages and water quality are maintained, this pondweed should prosper here. If the maintenance stops, the culverts will eventually plug, dikes will be breached, and the species will be lost from the landscape.

◆ **Spotted pondweed (*Potamogeton pulcher*) – Endangered, S1 G5**

Spotted pondweed is a submerged aquatic of the eastern United States, usually in acid water. In Wisconsin it is known from only five scattered sites. In 1938, a researcher collected spotted pondweed from “Potter Reservoir”, which is presently known as Eagle Nest Flowage, in Juneau County. It was not relocated in 1997-1998.

**Conservation concerns:** water quality, hydrology.

◆ **Vasey’s pondweed (*Potamogeton vaseyi*) – Special Concern, S2 G4**

Vasey’s pondweed is an annual species found primarily in shallow, relatively neutral, low alkalinity, low conductivity water of the northeastern United States and adjacent Canada. It is found scattered throughout Wisconsin (18 sites, 8 historical). Although not known from the BRSF, there is a 1969 site from Sprague Flowage in Juneau County, where it was found with common waterweed in clear, 8” deep water over a sandy bottom. It was not relocated in 1997-1998.

**Conservation concerns:** water quality.

◆ **Virginia meadow-beauty (*Rhexia virginica*), Special Concern, S2 G5**

A species of the northeastern United States and adjacent Canada that is most common along the Atlantic coastal plain, meadow-beauty is found in central and southern Wisconsin, with a high concentration of sites in GLW. There is one recovered historic site (Cemetery Road and Old Highway 54) and one new record (Battle Point Peatlands) for the BRSF, and several new sites in eastern Jackson County (several Old Highway 54 sites, plus one on a moss-drying area near Potter Flowage). 11 sites are known from Juneau County, mostly in ditches along Highway 80, but also along the Becker-Laske Roads and in the Blueberry Trail Complex. The species typically grows in seasonally wet, sandy-peaty ditches, often with other coastal plain species such as yellow screwstem and crossleaf milkwort. There are no records from Wood or Monroe Counties.

Similar to *Bartonia paniculata*, this species is apparently dependent on periodic disturbance that reduces shrub density and exposes bare mineral soil. In pre-settlement times, this regime may have included catastrophic fires, or perhaps the trails and/or wallows of large animals such as deer, elk, or bison. It is also

characteristic of the open shores of naturally fluctuating sandy-peaty ponds and lakes, which, however, is a very rare habitat type in the Black River and Meadow Valley landscapes.

There are a total of 31 Wisconsin sites; 9 of these were last seen before 1970. 14 of these sites are in the Black River/Meadow Valley landscape.

**Conservation concerns:** This species occupies a much smaller percentage of seemingly suitable habitat than its frequent associates *Bartonia virginica* and *Polygala cruciata*, and thus could be characterized as having more “conservative” habitat requirements than those species. Perhaps its seeds are less motile. Currently, periodic maintenance of roadside, railroad, powerline, and pipeline rights-of-way, appears to provide suitable habitat for this species, and will in many areas for the long. In other habitats (such as mown trails), there is no assurance that this disturbance regime will continue for the long term.

◆ **Silky willow (*Salix sericea*) – Special Concern, SH G5**

Silky willow is found in the northeastern United States and adjacent Canada, often in rocky ground next to flowing water. It is quite rare in Wisconsin with only 6 historic stations (not found in the state since 1967). However, willows are under-collected and the species may be somewhat overlooked. A 1948 collection from Clear Creek Fen near the Black River in the BRSF was not relocated in 1997. There are also historic collections from Melrose in Jackson County and Neillsville in Clark County. As this species might easily be overlooked, we will not assume that the lack of recent records indicates extirpation.

**Conservation concerns:** Uncertain.

◆ **Georgia bulrush (*Scirpus georgianus*) – Special Concern, SU G5**

This marsh species is scattered from Nova Scotia to Texas. In Wisconsin, we only know it from 5 historic locations. There is a 1968 collection from near the junctions of Old Highway 54 and Cemetery Road in BRSF. This site was searched several times and the species not relocated in 1997. However, a recent (2000) examination of the specimen on which this record is based revealed that the plant was actually collected along “new” State Hwy. 54, and thus may still be extant.

**Conservation concerns:** Uncertain, but probably habitat destruction or degradation.

◆ **Torrey’s bulrush (*Scirpus torreyi*) – Special Concern, S2S3 G5?**

Torrey’s rush is found in shallow water of sandy or peaty shores from Quebec to Missouri, and is rare in many of the states in between. It is scattered throughout Wisconsin, mostly in the northwestern counties in sandy or peaty wetland edges. Two sites are documented in MVWA, and they are very large. There are a total of 24 Wisconsin sites.

**Conservation concerns:** changes in water level, physical disturbance of shores.

◆ **Reticulated nutrush (*Scleria reticularis*) – Endangered, S1 G4**

This small sedge is found in the eastern United States, south into the tropics. It is rare in the interior United States, and in Wisconsin is found in only three disjunct coastal plain marshes, two in Adams County, the other discovered in 1997 at Brockway Lake No. 1 on Jackson County Forest land just south of the BRSF boundary. The tiny population grows at the very wettest part of a small, fluctuating, sandy-muddy pond unlike any other noted in Jackson County.

**Conservation concerns:** This is a species of the open shores of naturally fluctuating, sandy-peaty ponds and lakes. This is a very rare habitat type in the Black River and Meadow Valley landscapes, apparently well-developed only at Brockway Lake No. 1.

◆ **Whip nutrush (*Scleria triglomerata*) – Special Concern, S2S3 G5**

This sedge with long, whiplike stems is found in the eastern United States, south into the tropics. It is scattered in central and southern WI, where its habitat requirements are not well documented. In the BRSF it was found at 4 new sites, 3 of them in ditches along Highway 54, where it formed long, linear colonies at the ecotone between seasonally wet sandy-peaty below, and dry sand prairie on the embankments above.

There are a total of 32 Wisconsin sites; 18 of these were last seen before 1970. Four sites are in the Black River/Meadow Valley landscape.

**Conservation concerns:** This species is apparently dependent on periodic disturbance (to bare mineral soil) for population maintenance. In pre-settlement times, this regime may have included catastrophic fires, or perhaps the trails and/or wallows of large animals such as deer, elk, or bison. Currently, periodic maintenance of roadside rights-of-way, including occasional mowing, appears to mimic the natural disturbance regime. It has a narrower niche than either *Bartonia virginica* or *Polygala cruciata*, and grows in a very specific habitat, on the mid- to lowest- slopes of roadside embankments immediately adjacent to acid, sphagnum ditches. No “natural” populations are known from the Black River and Meadow Valley landscapes. However, “natural” populations from forest or savanna/wetland ecotones are known from Ft. McCoy in Monroe Co., and in various places along the lower Wisconsin River.

◆ **Shadowy or cliff goldenrod (*Solidago sciaphila*) – Special Concern, S3 G3G4**

A regional endemic nearly restricted to the “driftless area” of southeastern Minnesota, southwestern Wisconsin, northeastern Iowa, and northwestern Illinois, this goldenrod is now known from almost 100 sites in Wisconsin. The preferred habitats are exposed, partly sunny sandstone cliff edges, usually under an open forest of pines (jack, red, or less commonly white) or oaks, often with few other herbaceous associates. It may also occur on shaded but dry cliffs. Six new sites were discovered on sandstone outcrops in the BRSF in 1997. There are a total of 14 sites in Jackson County, mostly within 15 miles of the Black River, rarely ranging east to Bear Bluff.

There are a total of 91 Wisconsin sites; 34 of these were last seen before 1970. Seventeen of these sites are in the study area.

**Conservation concerns:** Fire suppression. In spite of its specific epithet (*sciaphila* means “shade-loving”), this cliff-loving goldenrod appears to require periodic canopy opening to survive. It is thriving and spreading, for examples, on steep, open, north-facing slopes on Belle Mound that were burned in a large, intense fire in 1977.

◆ **Small-flowered woolly bean (*Strophostyles leiosperma*) – Special Concern, S2 G5**

A pink-flowered vine in the pea family, this species grows in dry or moist sandy soil, upland woods, dunes and shores from Connecticut to Arizona. We know of 14 Wisconsin populations, 8 of them last confirmed before 1970. In 1997, researchers noted one population on Meadow Valley, and 2 others in the study area. This means that fully half of the recently confirmed Wisconsin populations of small-flowered woolly bean are within the study area.

**Conservation concerns:** Fire suppression. Ecologists have found that native vines in the pea family quickly disappear from prairies and savannas when they are not burned. Prescribed fire may be very important in maintaining populations of small-flowered woolly bean.

◆ **Prairie fame-flower (*Talinum rugospermum*) – Special Concern, S3 G3?**

This small, rosette-forming succulent is restricted to the central United States, with perhaps the largest number of populations in the world in Wisconsin, especially at Fort McCoy Military Reservation. In Wisconsin it is found scattered throughout the western and southern parts of the state in sand barrens, dry prairies, and dry oak woodlands. One new site, in the Millston Ridge Oak Barrens, was found in 1997 in the BRSF. Two other new sites were found on Jackson County Forest lands west of the Forest in 1996-1997. A population along Lambert Road, in the sandy apron that formed from a road cut through sandstone, has hundreds of plants.

There are a total of 40 Wisconsin sites, all confirmed recently. 3 of these sites are in the Black River/Meadow Valley landscape, and the single population within the BRSF appears to be marginally viable.

**Conservation concerns:** This species may require periodic disturbance (it is often found in very old sandy road ruts), but cannot survive repeated frequent trampling or vehicle traffic. It needs lots of sun, which makes it vulnerable to fire suppression and succession.

◆ **Bog (Massachusetts) fern (*Thelypteris simulata*) – Special Concern, S3 G4G5**

Wisconsin populations of this wetland fern are highly disjunct from the bulk of its global distribution. Found in the eastern United States and adjacent Canada, mostly near the Atlantic coast, the nearest populations are in mid-Pennsylvania. In Wisconsin, it typically grows in white pine – red maple swamps, but can also be found in alder thickets, and, rarely, fens and moist cliffs. Common understory associates are cinnamon fern, skunk cabbage, and winterberry holly. Unlike its frequent associate, long fern, this species appears not to tolerate logging and subsequent canopy opening very well.

There are a total of 68 Wisconsin sites, and all of them have been recently verified. Forty-nine of these were discovered since 1997 in the Black River/Meadow Valley landscape. The following number of new or relocated sites were found in 1997-1998 in various counties: Clark (2), Jackson (33, including 20 in BRSF), Monroe (7), Wood (4), and Juneau (3).

**Conservation concerns:** Sensitive to canopy disruption (logging). Wetland habitat sensitive to flooding or water table depression. See *Carex folliculata* above.

◆ **Hidden-fruited bladderwort (*Utricularia geminiscapa*) – Special Concern, S3 G4G5**

A tiny, inconspicuous submersed aquatic that rarely produces above-surface yellow flowers, this species is found in the northeastern United States and adjacent Canada. It usually grows in low alkalinity, low conductivity water of close-to-neutral pH. It is scattered throughout Wisconsin in ponds and lakes, with concentrations in Vilas County and GLW. In the BRSF, it has turned out to be locally common in artificial impoundments and ditches, where 15 new sites were found in 1997. Several additional new sites were found in GLW outside of the BRSF, in Wood County (Cranberry Road) and Juneau County (Sprague-Mather Flowage and Second Avenue in Meadow Valley Wildlife Area).

It is not certain how many, if any of the Black River / Meadow Valley landscape populations represent pre-settlement occurrences that have survived to the present day. Migrating birds might easily disperse this species between water bodies. Some populations in small pools (puddles, really) and game trails in undisturbed peatlands may be native.



There are a total of 56 Wisconsin sites; 9 of these were last seen before 1970. Researchers have documented 25 sites in the study area.

**Conservation concerns:** water quality, hydrologic disturbances.

◆ **Purple bladderwort (*Utricularia purpurea*) – Special Concern, S3 G5**

This aquatic is found in the eastern United States and adjacent Canada. It flowers infrequently, but when it does, the result is a spectacular show, with an entire pond or lake surface becoming a mass of purple blooms. Purple bladderwort is scattered throughout Wisconsin, but is commoner in the north. It grows in low alkalinity, low conductivity, and generally low pH lakes in Wisconsin. It was not found in the BRSF, but has been known since 1968 (relocated 1998) from a huge population in shallow water over mucky peat in the Cranmoor Flowage in Wood County.

There are a total of 28 Wisconsin sites; 6 of these were last seen before 1970. The Cranmoor population's great size, extent, and evident longevity make it one of the most stable in Wisconsin.

**Conservation concerns:** water quality, hydrologic disturbances.

◆ **Sand violet (*Viola fimbriatula*) – Endangered, S2 G5**

Now more generally recognized as *Viola sagittata* var. *ovata*, this taxon appears to intergrade with the common arrow-leaved violet *V. sagittata* var. *sagittata* in the BRSF in such habitats as seasonally wet, sandy impoundment dikes at Big Bear Flowage. Sand violet is a species of the northeastern United States and is rare in western and central Wisconsin. Several historic sites were relocated and 10 new sites discovered in 1997 in the BRSF. The commonest habitat was along ski-hiking trails in the Smrekar-Wildcat Ridge areas, and on roadside shoulders in sandy soil with little competition. In either case, plants are most common where trails or roads traverse sandstone cut, and scattered small jack pines are frequent associates.

There are a total of 20 Wisconsin sites; 3 of these were last confirmed before 1970. Seventeen sites occur in Jackson County in or near the BRSF.

**Conservation concerns:** The species was never seen in a truly “natural” habitat and appears to require frequent disturbance to survive.